



UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Complements of Mathematics

Academic Year 2026/2027

1. Organic Unit

Faculty of Business and Economic Sciences

2. Course

Business Management

3. Cycle

1st

4. Course Unit

Complements of Mathematics (24107)

5. Scientific Area

6. Curricular Year

1st

7. Type of Curricular Unit / Semester

2nd Semester



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8. Class type and workload (work time)

Theoretical classes:

Practical classes:

Theoretical-Practical Classes 30,00

Tutorial Guidance: 20,00

9. ECTS Credits

6,00

10. Scientific Area Coordinator

11. Regent

Prof. Doutor ALEXANDRE MANUEL MORAIS MENA E SILVA

12. Assistants

Dr. JOSÉ MANUEL SILVA GUERREIRO LOUÇÃO DE MATOS

13. Teaching Language

Portuguese

14. General Objectives

The curricular unit, by promoting the learning of some structural concepts of Mathematical Analysis and by presenting some applications of these concepts, aims to provide students with the mathematical tools that are indispensable for the study of various disciplines in the field of Economics, namely those involving quantitative aspects.

15. Specific Objectives

To familiarise students with the integration of real-valued functions of one real variable and with differential calculus for real-valued functions of several real variables.

16. Skills to be acquired

Students should be able to:

- calculate antiderivatives and integrals and apply their fundamental properties;
- analyse real-valued functions of several real variables, calculate partial derivatives and solve unconstrained and constrained optimisation problems;
- select and apply appropriate mathematical techniques to a range of exercises and problems;
- demonstrate geometric intuition.

17. Teaching Methodology

The course is organised in theoretical/practical sessions (with presentation of main concepts and properties) supported by tutorial sessions where examples of application will be presented.



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18. Course Unit Program

1. Antiderivatives
 - 1.1. Concept of antiderivatives and general properties;
 - 1.2. Standard antiderivatives;
 - 1.3. Integration by parts;
 - 1.4. Integration of rational functions;
 - 1.5. Integration by substitutionOne-dimensional integral calculus.
2. One-dimensional integral calculus
 - 2.1. The Riemann integral;
 - 2.2. Properties of integrals;
 - 2.3. The Fundamental Theorem of Calculus;
 - 2.4. Calculation of bounded plane areas;
 - 2.5. Indefinite integrals;
 - 2.6. Improper integrals Real functions of several real variables.
3. Real functions of several real variables
 - 3.1. General concepts; Domains and graphical representation; Level curves;
 - 3.2. Brief overview of limits and continuity;
 - 3.3. Partial derivatives. Chain rule;
 - 3.4. Implicitly defined functions;
 - 3.5. Optimization
 - 3.5.1. Unconstrained extrema;
 - 3.5.2. Extrema on bounded and closed domains;
 - 3.5.3. Constrained extrema.

19. Assessment Methods

The Regulations for the Assessment of Knowledge and Skills currently in force will apply. Continuous assessment must include oral contributions distributed throughout the teaching period and a final written test.

20. Didactic Resources

Bibliographic indications and a theoretical-practical workbook available on Moodle.

21. Sustainability Objectives

- SDG 4. Quality Education. Develop skills in logical reasoning, inductive and deductive reasoning. Modeling and problem solving.
- SDG 8. Decent Work and Economic Growth. Improve employability through mathematical skills and analytical skills.
- SDG 9. Industry, Innovation and Infrastructure. Apply mathematics to innovation and technological development.



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22. Keywords

Antiderivatives
Riemann Integral
Functions of several variables
Optimisation



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23. Main Bibliography

Author(s): R. Larson, R. P. Hostetler, B. H. Edwards
Title: Cálculo
Edition: 8^a Year: 2006
Local: São Paulo
Publisher: McGraw-Hill
ISBN Code: 978-85-86804-56-4

Author(s): A. Monteiro, I. Matos
Title: Primitivas-Cadernos de Matemática
Edition: 1^a Year: 2014
Local: Alfragide
Publisher: Orion
ISBN Code: 978-972-8620-25-7

Author(s): Bento Louro; Ana Alves de Sá
Title: Cálculo Diferencial e Integral em R - volume 2
Edition: Year: 2022
Local: Lisboa
Publisher: Escolar Editora
ISBN Code: 9789725925980

24. Complementary Bibliography

Author(s): Saturnino L. Salas, Einar Hille e Garret J. Etgen
Title: Calculus: One and Several Variables
Edition: 10^a Year: 2006
Local: New Jersey
Publisher: John Wiley & Sons
ISBN Code: 978-0-471-69804-3

Author(s): B. Demidovitch
Title: Problemas e Exercícios de Análise Matemática
Edition: Edição revista Year: 1993
Local: Lisboa
Publisher: McGraw-Hill de Portugal
ISBN Code: 972-9241-53-8



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Ficha técnica MIP / MIP Datasheet	
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